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(71) Applicant(s)
NEC Corporation

(Incorporated in Japan)

7-1,Shiba 5-Chome, Minato-Ku, Tokyo 108-01, Japan

(72) Inventor(s)
Kohei Nishiyama

(74) Agent and/or Address for Service
John Orchard & Co
Staple Inn Buildings North, High Holborn, LONDON,
WC1V 7PZ, United Kingdom

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(54) Radio telephone system

(57) A telephone number memory stores telephone numbers which are divided into telephone number groups, and a response message memory stores response messages corresponding to the telephone number groups. In the automatic response mode, when a call is generated, a telephone number of a caller is checked as to whether the telephone number is stored in the telephone number memory, and, when the same telephone number is found therein, a response message of the telephone number group, to which the received telephone number belongs, is transmitted to the caller.

FIG. 2

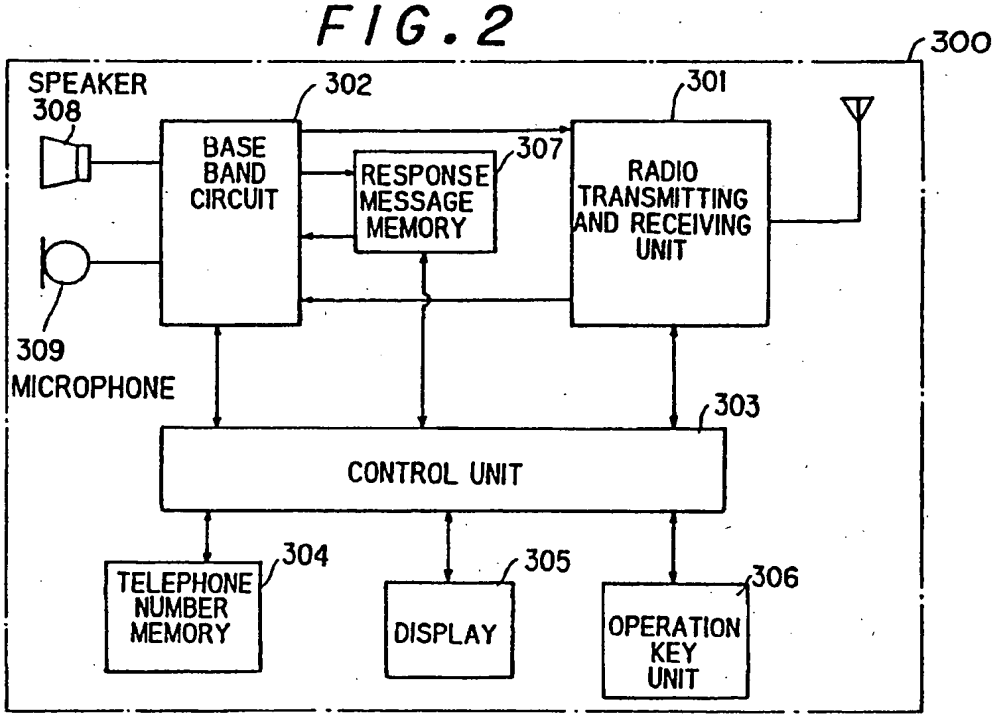

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FIG. 1

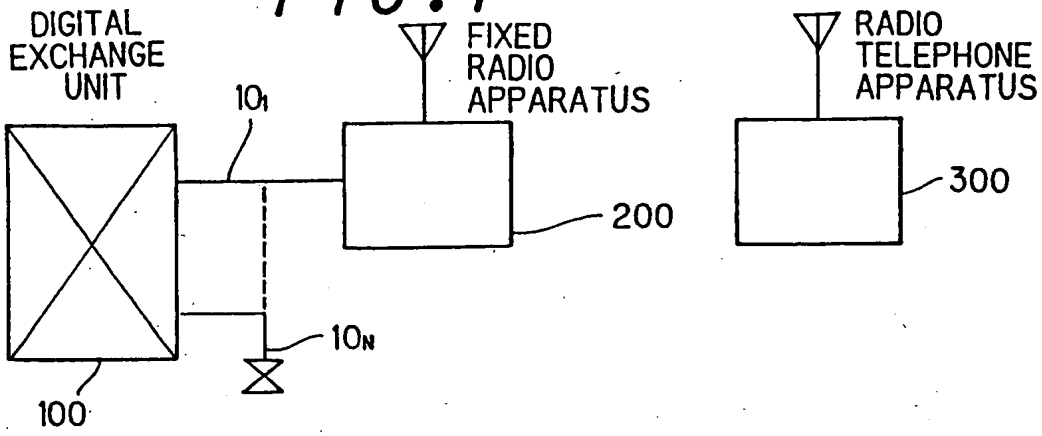


FIG. 2

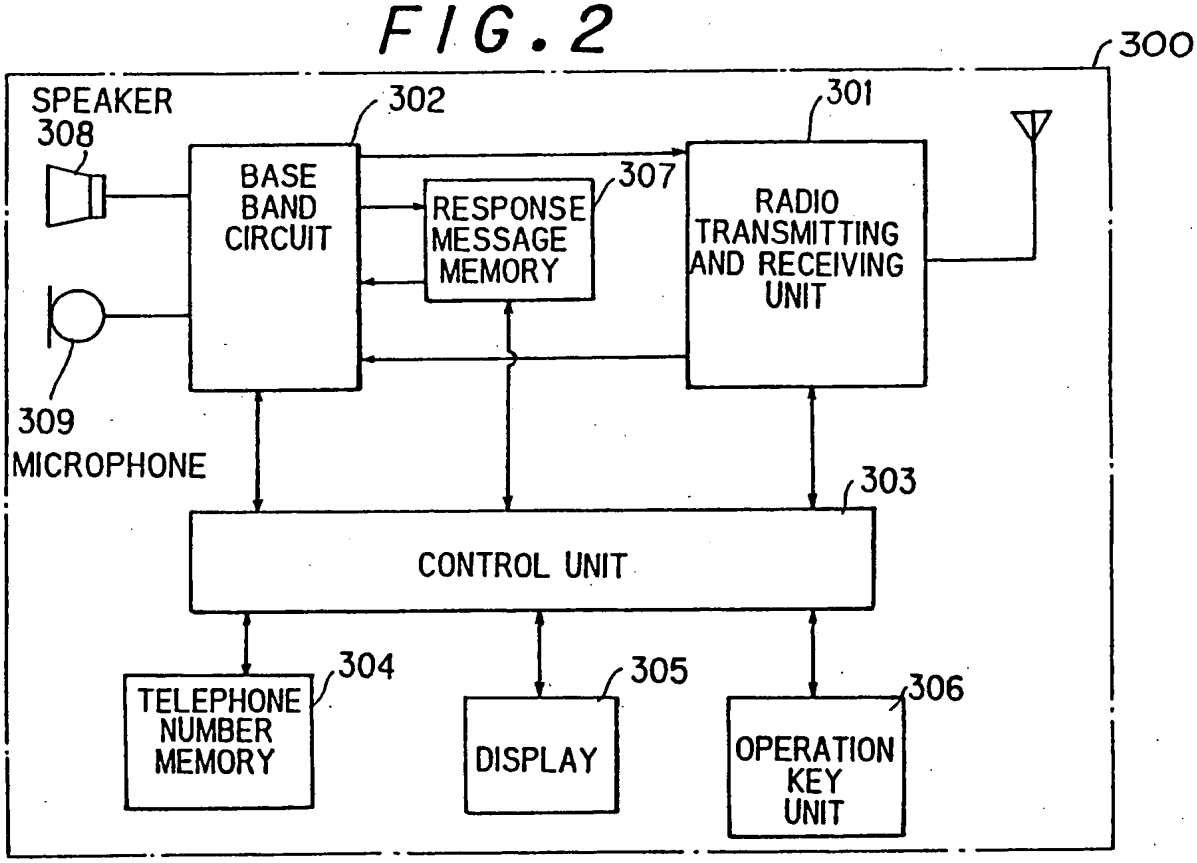


FIG. 3

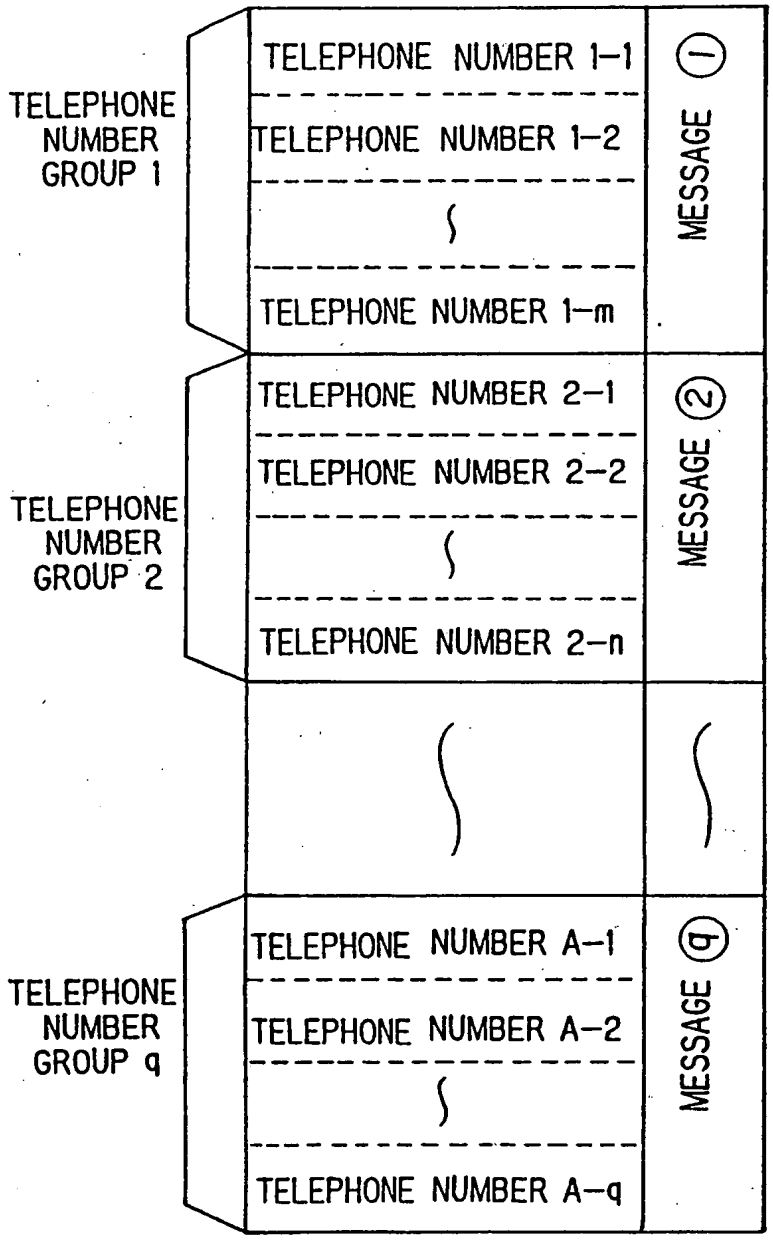
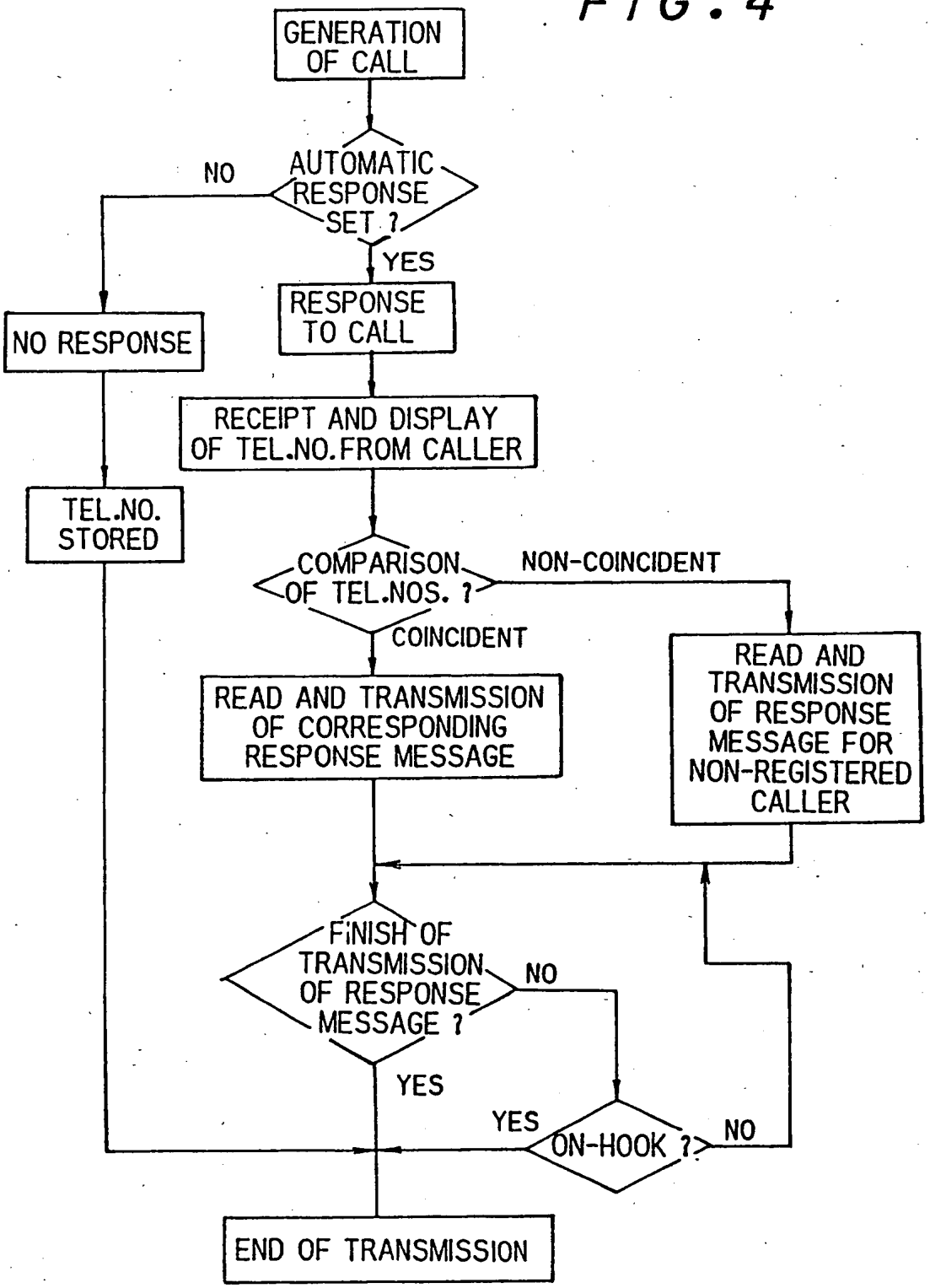


FIG. 4



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RADIO TELEPHONE SYSTEM

The invention relates to a radio telephone system, and more particularly to, a telephone responding system in which a response message is selected dependent on a telephone number of a caller from plural stored response messages.

A conventional radio telephone system has been described in Japanese Patent Kokai No. 63-245047. In the conventional radio telephone system, a response message such as instruction, by which a caller is instructed to input a telephone number of the caller by using keys, is transmitted via a radio telephone line from, for instance, a car telephone set of a callee to a telephone set of the caller, when the callee who is, for instance, a car driver is outside a car, and, therefore, no one is inside the car. Thus, the caller operates key to input his telephone number to be transmitted to the car telephone set, so that the transmitted telephone number is stored in a RAM of the car telephone set. Then, the car telephone set read a telephone number of a pager (pocket bell) carried by the car driver from the RAM, and dials the pager's telephone number to call the car driver carrying the pager, so that the pager is connected to the car telephone set by a radio telephone line.

Then, the telephone number of the caller is read from the RAM in the car telephone set to be transmitted to the pager. Thus, the car driver which is outside the car is informed that the caller has telephoned him during his absence from the car,

and the telephone number of the caller is displayed on a display of the pager.

In the conventional radio telephone system, however there is a disadvantage in that a telephone set for an absent callee can not respond to a caller by a response message which is appropriate dependent on who the caller is. In other words, the same response message is allocated to different callers having different relations to the callee.

A feature of one arrangement to be described is the provision of a radio telephone system in which a response message is selected from plural response messages dependent on who a caller is.

Plural response messages are conveniently stored in a telephone set for a callee who may be absent at the time of receiving a call.

In a particular arrangement, an absent callee is able to respond to a caller in accordance with a response message which is most appropriate to the caller by selecting one from plural stored response messages.

In a particular arrangement to be described by way of example, there is a radio telephone apparatus which includes a radio telephone set circuit for transmitting a signal to a fixed radio apparatus and receiving a signal therefrom;

a response message memory for storing at least one response message;

a telephone number memory for storing at least one telephone number and at least one telephone group for the at least one telephone number; and

a control unit for controlling the radio telephone set circuit to operate in signal transmitting and receiving modes;

wherein the control unit compares a telephone number of a caller included in information received from the fixed radio apparatus with a telephone number stored in the telephone number memory in an automatic response mode, and, when the telephone number of the caller is coincident with the telephone number stored, the control unit read a corresponding response message to a telephone number group of the telephone number stored from the response message memory, and controls the radio telephone set circuit to transmit the corresponding response message via the fixed radio apparatus to the caller.

Arrangements which enable the invention to be better understood will now be described, by way of example, with reference to the accompanying drawings, in which:-

Fig. 1 is a block diagram showing a radio telephone system in a preferred embodiment according to the invention,

Fig. 2 is a block diagram showing a radio telephone set included in the preferred embodiment as shown in Fig. 1,

Fig. 3 is an explanatory diagram showing a memory for storing telephone numbers and response messages used in the radio telephone set as shown in Fig. 2, and

Fig. 4 is a flow chart showing operation in the preferred embodiment.

Fig. 1 shows a radio telephone system in the preferred embodiment which comprises a digital exchange unit 100 connected to plural telephone lines 10_1, ----- 10_N, fixed radio apparatus 200 connected via the telephone lines 10_1, ----- 10_N to the digital exchange unit 100, radio telephone apparatus 300 connected via radio telephone lines to the fixed radio apparatus 200.

Fig. 2 shows the radio telephone apparatus 300 comprises a radio transmitting and receiving unit 301, a base band circuit 302, a control unit 303, a telephone number memory 304, a display 305, an operation key unit 306, and a response message memory 307.

In the radio telephone apparatus 300, the radio transmitting and receiving unit 301 is an interface, by which control and communication signals are transmitted and received via the radio telephone line, the fixed radio apparatus 200 and the telephone line 10_1 between the digital exchange unit 100 and the radio telephone apparatus 300.

The base band circuit 302 comprises a modem circuit for modulating a transmitting signal to be supplied to the transmitting and receiving unit 301 and demodulating a received signal supplied therefrom, a driver circuit for driving a speaker 308, and amplifier for amplifying a signal supplied from a microphone 309, and a memory for storing instructions and codes

to transmit signals to and receive signals from the fixed radio apparatus 200.

The control unit 303 controls the radio transmitting and receiving unit 301 to select a radio telephone line, and transmit and receive data, the base band circuit 302 to transmit and receive a communication signal and a control signal, the display 305 to display visual information, the operation key unit 306 to supply key input information thereto, and other units in the radio telephone apparatus 300 to operate in the manner described below.

The telephone number memory 304 stores at least one telephone number group and at least one telephone number belonging to the telephone number group to be compared with a telephone number of a caller received via the telephone line 10_1, the fixed radio apparatus 200, and the radio telephone line from the digital exchange unit 100.

The display 305 comprises LCDs or lamps for displaying the key input information, control state and the like.

The operation key unit 306 comprises dials and keys for input of instruction and data for the radio telephone apparatus 300 to operate as a radio telephone set.

The response message memory 307 stores at least one kind of a response message.

Fig. 3 shows one pattern; of telephone number groups and telephone numbers assigned to the telephone number groups which are stored in the telephone number memory 304. As clearly shown therein, "q" kinds of the telephone number groups,

to each of which plural telephone numbers 1-1, 1-2, ----- 1-m, 2-1, 2-2, ----- 2-n, and A-1, A-2, ----- A-q, and numbers ①, ② - ----- ⓠ of the response messages are assigned, are store in the telephone number memory 304.

In operation, a call is generated in a telephone set for a caller, so that the call is transmitted from the digital exchange unit 100 via the telephone line 10_1, the fixed radio apparatus 200, and the radio telephone line to the radio telephone apparatus 300.

In the radio telephone apparatus 300, information of the caller, that is, a telephone number of the caller which is received in the transmitting and receiving unit 301 is discriminated in the base band circuit 302, and the discriminated result is displayed on the display 305. When automatic response, that is, automatic answering function is set, the control unit 303 accesses the telephone number memory 304 to check as to whether the received telephone number is one of stored telephone numbers or not. When the received telephone number is coincided with one of the stored telephone numbers, one of the message number ①, ② ----- ⓠ corresponding to the telephone number group, to which the received telephone number belongs, is read from the telephone number memory 304.

Then, the control unit 303 reads a response message from the response message memory 307 in accordance with the message number thus read from the telephone number memory 304. The response message thus read from the response message memory 307 is transmitted via the base band circuit 302 and the radio

transmitting and receiving unit 301 to the caller. On the other hand, when the received message is not found in the telephone number memory 304, a response message which is not designated by the message numbers ①, ② ----- ⓠ is read from the response message memory 307 for non-registered callers. Thus, the response message for the non-registered callers is transmitted to the caller in the same manner as the registered callers described above.

On the contrary, when the automatic response, that is, the automatic answering function is not set, any message is not transmitted to the caller who only hears the absence tone of a callee, and the telephone number of the caller is stored in a no-response telephone number memory (not shown) in the radio telephone apparatus 300. When the number of telephone numbers to be stored into the no-response telephone number memory is over the storing capacity thereof, the oldest telephone number is erased to store the newest telephone number.

One example of the response message is "The engineers of NEC Corporation are kindly asked to give the results of the conference to Mr. Hayashi by the telephone number of 5933-1234".

In the preferred embodiment, when the operation of "off-hook" is not carried out during the transmission of the response message, the whole control is completed upon the termination of the response message transmission. On the other hand, when the off-hook is effected during the transmission of the response message, a callee can start telephone conversation with the caller subsequently to the interrupted

transmission of the response message.

Although the invention has been described with respect to a specific embodiment, by way of example, it will be understood that variations and modifications thereof, as well as other embodiments, may be made within the scopy of the appended claims.

CLAIMS

1. A radio telephone system, comprising:

a radio telephone apparatus which comprises:

a radio telephone set circuit for transmitting a signal to a fixed radio apparatus and receiving a signal therefrom;

a response message memory for storing at least one response message;

a telephone number memory for storing at least one telephone number and at least one telephone group for said at least one telephone number; and

a control unit for controlling said radio telephone set circuit to operate in signal transmitting and receiving modes;

wherein said control unit compares a telephone number of a caller included in information received from said fixed radio apparatus with a telephone number stored in said telephone number memory in an automatic response mode, and, when said telephone number of said caller is coincident with said telephone number stored, said control unit read a corresponding response message to a telephone number group of said telephone number stored from said response message memory, and controls said radio telephone set circuit to transmit said corresponding response message via said fixed radio apparatus to said caller.

2. A radio telephone system, according to claim 1, whrien:

said control unit controls said radio telephone set

circuit to carry out telephone communication with a telephone set of said caller, when "off-hook" is effected by a callee operating a telephone set of said radio telephone set circuit during transmission of said response message, said transmission of said response message being terminated by said "off-hook".

3. A radio telephone system, according to claim 1, wherein:

said control unit controls said radio telephone set circuit to transmit no response message, when said control unit selects non-response mode by canceling said automatic response mode.

4. A radio telephone set system, according to claim 1, wherein:

said fixed radio apparatus is connected via a telephone line to a digital exchange unit.

5. A radio telephone set system, according to claim 3, wherein:

said telephone number of said caller is stored in a memory in said non-response mode.

6. A radio telephone set system, according to claim 4, wherein:

said digital exchange unit is connected to a plurality of fixed radio apparatus by a plurality of telephone lines.

7. A radio telephone set system as claimed in claim 1 including an arrangement substantially as described herein with reference to any one of Figs. 1 to 3 of the accompanying drawings.

8. A radio telephone system as claimed in claim 1 operated in a way substantially as described herein with reference to Fig. 4 of the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
The Search report) -12-

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Relevant Technical Fields

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(ii) Int Cl (Ed.5) H04M, H04Q

Search Examiner
AL STRAYTON

Date of completion of Search
13 SEPTEMBER 1994

Databases (see below)
(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant following a search in respect of Claims :-
All

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	EP 0330856 A2	(MOTOROLA) especially column 5, lines 1-14	1
X	US 4985913	(SHALOM) especially column 1, line 56 to column 2, line 27	1

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).